UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

September 3, 2020

Refer to NMFS No: OPR-2020-02191

Suilin W. Chan
Chief
Permitting Section
Air and Radiation Division
U.S. Environmental Protection Agency, Region 2
290 Broadway
New York, NY 10007-1866

RE: Concurrence Letter for the U.S. Environmental Protection Agency Region 2 Approval of the Proposed Limetree Bay Terminal Air Permit, St. Croix, U.S. Virgin Islands

Dear Ms. Chan:

On August 11, 2020, the National Marine Fisheries Service (NMFS) received your request for written concurrence under the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et seq.) that the Environmental Protection Agency's (EPA) approval of a proposed air permit for the Limetree Bay Terminal, St. Croix, U.S. Virgin Islands under the Clean Air Act (42 U.S.C. §7401 et seq.), is not likely to adversely affect species listed as threatened or endangered or critical habitats designated under the ESA. This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at (50 C.F.R. §402), and agency guidance for preparation of letters of concurrence.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with agency guidelines issued under section 515 of the Treasury and General Government Appropriations Act of 2001 (Data Quality Act; 44 U.S.C. 3504(d)(1) and 3516). A complete record of this informal consultation is on file at NMFS Office of Protected Resources in Silver Spring, Maryland.

Action Agency's Effect Determinations

The EPA determined that emissions under the proposed permit may affect, but are not likely to adversely affect, blue, fin, sei, or sperm whales; the North and South Atlantic Distinct Population Segments (DPSs) of the green turtle (*Chelonia mydas*), Northwest Atlantic Ocean DPS of the loggerhead turtle (*Caretta caretta*), hawksbill turtle (*Eretmochelys imbricata*), and leatherback turtle (*Dermochelys coriacea*); giant manta ray (*Manta birostris*); Nassau grouper (*Epinephelus striatus*); oceanic whitetip shark (*Carcharinus longimanus*); Central and Southwest Atlantic DPS of the scalloped hammerhead shark (*Sphyrna lewini*); and boulder star (*Orbicella franksi*), elkhorn (*Acropora palmata*), lobed star (*Orbicella annularis*), mountainous star (*Orbicella faveolata*), pillar (*Dendrogyra cylindrus*), rough cactus (*Mycetophyllia ferox*), and staghorn (*Acropora cervicornis*) corals.

Proposed Action and Action Area

EPA seeks to approve a permit for Plant-wide Applicability Limits (PAL) for emissions of volatile organic compounds, nitrogen oxides, carbon monoxide, particulate matter, and sulfur dioxide from the Limetree Bay petroleum refinery. The Limetree Bay facility is a large-scale energy complex consisting of a refinery with peak processing capacity of 650 thousand barrels of petroleum feedstock per day and a 34-million-barrel crude and petroleum products storage and marine terminal. Pursuant to the procedures in 40 C.F.R. §52.21 (aa)(6) of the Clean Air Act, the PAL limits were based on the sum of the actual emissions, by pollutant, for each emissions unit at the plant during a baseline period from 2009 to 2011, plus the applicable significant level (as defined at 40 C.F.R. §52.21(b)(23)) for each pollutant.

The proposed permit contains federally enforceable emission monitoring and reporting requirements for the petroleum refinery. Continuous emission monitoring, continuous parametric monitoring, engineering calculations using emission factors, or engineering calculations using mass balance are imposed on Limetree to continuously measure the emissions of the PAL pollutants to ensure compliance with the PAL limits. The EPA is requiring ambient air monitoring for three of the most stringently regulated air quality pollutants to ensure that the resulting air quality impacts are within the National Ambient Air Quality Standards. The standards for these pollutants are the hardest to meet given their low threshold values and averaging times. Limetree must submit semi-annual monitoring reports and prompt deviation reports to EPA for review.

Stressors of the Action

In this case, the annual PAL limits are as follows: 6,094 tons per year (TPY) volatile organic chemicals; 5,231 TPY nitrogen oxides; 3,248 TPY carbon monoxide; 399 TPY particulate matter less than 2.5 microns in diameters (PM2.5); 412 TPY particulate matter less than 10 microns in diameters; 466 TPY total particulates; and 1,482 TPY sulfur dioxide. Among these emissions, the most stringently regulated are nitrogen oxides, sulfur dioxide, and PM2.5. These are treated as indicator components in the impact analyses for the permitted emissions as a whole. The facility operators have informed EPA that the facility burns only refinery gas, diesel, or propane/butane, and not residual fuel (No. 6 fuel oil). Combustion of residual fuel is associated with emissions of polycyclic aromatic hydrocarbons, metals, organics, and mercury. The fuels that are used by the facility should not emit significant amounts of these pollutants. These pollutants are therefore not considered relevant to an assessment of the PAL permit. This consultation focuses on emissions for the three most stringently regulated pollutants: nitrogen oxides, sulfur dioxide and PM2.5.

The permitted emissions will include sulfur and nitrogen in gaseous forms and as particulate nitrate and sulfate. NMFS was not able to find information on the effects of localized coastal and vessel sulfur and nitrogen emissions on seawater chemistry. While sulfur and nitrogen naturally occur in air and water, the forms emitted are respiratory irritants and, for water, are classified as “acidifying deposition.”

Deposition of sulfur and nitrogen from atmospheric emissions is known to acidify and deplete ecological communities of inland freshwaters though altering aquatic chemistry, causing gill damage and impairing the ability of aquatic animals to uptake oxygen from the water and

regulate ion balance (Dodds 2002). Critical loads for nitrogen and sulfur were developed for inland waterbodies because they are particularly vulnerable to acid deposition. Critical load varies with each complex ecosystem and is largely dependent on the buffering, or acid neutralizing capacity, of that system. There are three characteristics of the waters off the southern coast of St. Croix that could mitigate, if not eliminate, localized effects of Limetree's emissions on water chemistry and, importantly, carbonate availability to ESA-listed corals. The coast is not sheltered, so the waters are well mixed by wind and wave action and dispersion would be rapid. The dilution volume of the Caribbean Sea is vast relative to the acid rain-sensitive waters for which critical loads were developed. Finally, seawater is well buffered, with a relatively higher acid neutralizing capacity than acid rain-sensitive waters (Stumm and Morgan 1996).

For sensitive freshwaters, critical loads for sulfate ranged from 2.7 to 20 kilograms per hectare per year while the maximum-modeled Limetree deposition rate for sulfur was 0.6 kilograms per hectare per year (Figure 1). The difference between wet sulfate (SO_4^{-2}) deposition and sulfur deposition (S) was not explained in EPA's request for concurrence. These are not equivalent substances. A gram of sulfate contains about 0.3 grams of actual sulfur. The lowest protective threshold of 2.7 kilograms sulfate per hectare per year is equivalent to 0.9 kilograms sulfur per hectare per year.

The request for concurrence cited critical loads for nitrogen to freshwater systems of 5 and 10 kilograms per hectare per year. The maximum value of Limetree's modeled nitrogen deposition was approximately 0.24 kilograms per hectare per year (Figure 1) in the surrounding waters, well below the freshwater critical loads. The EPA also provided a total particulate matter deposition net estimate of 1.2 kilograms per hectare per year for multiple nitrogen and sulfur species. This is also less than the critical loads developed for nitrogen in freshwaters.

While acidifying deposition will occur in the action area, increased ocean acidification due to permitted sulfur and nitrogen emissions is unlikely in waters off the southern coast of St. Croix because the emissions are below critical loads that would acidify more sensitive freshwaters and the physical characteristics of the southern coast of St. Croix result very short residence times for deposited atmospheric pollutants.

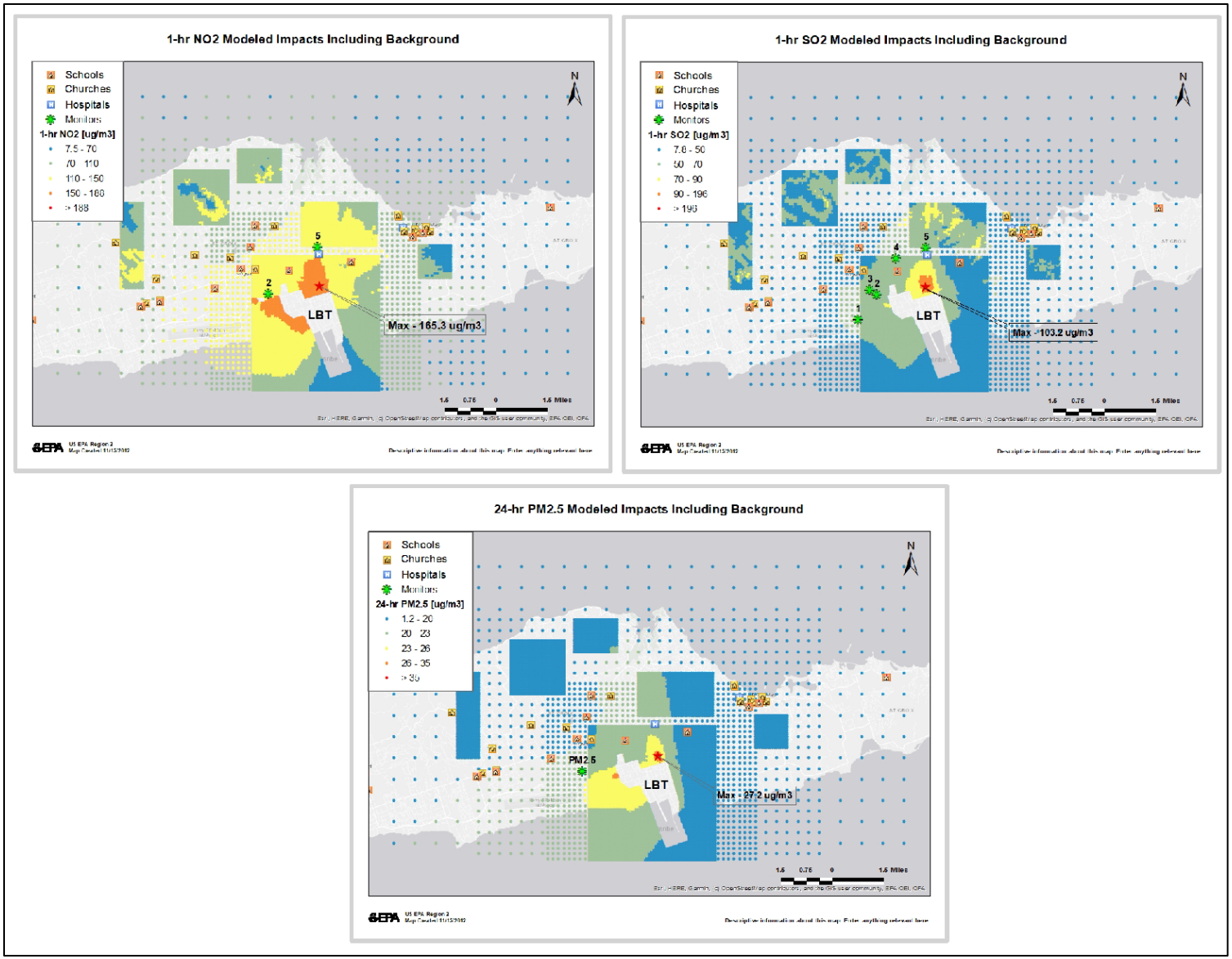

Figure 1. Modeled surface level air concentrations for nitrogen dioxide, sulfur dioxide, and PM2.5

Action Area

"Action area" means all areas affected directly or indirectly by the Federal action, and not just the immediate area involved in the action (50 C.F.R. §402.02). The facility is located on the southern coast of St. Croix (Figure 2).[1] For this action, the action area includes the Caribbean Sea to the south and west of the island of St. Croix, U.S. Virgin Islands, where the plume from plant emissions and associated deposition of components from these emissions may occur. The modeled total annual deposition of the three pollutants with the most stringent National Ambient Air Quality Standards criteria: particulates, nitrogen species, and sulfur species is represented in Figure 3.

Figure 2. Aerial image of St. Croix with Limetree Bay Refinery circled in red.

[1] credit: NASA www.jpl.nasa.gov/spaceimages/details.php?id=PIA22894

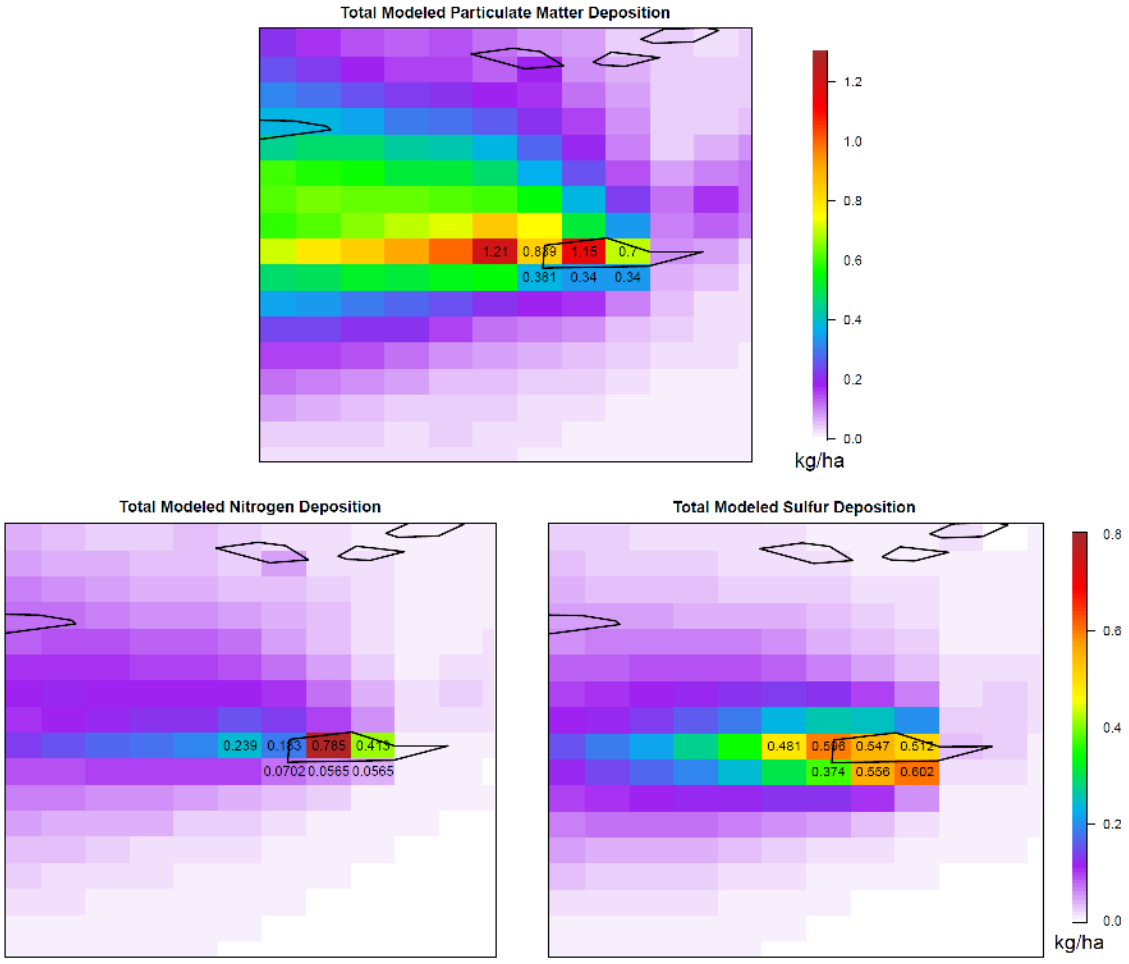

Figure 3. Total modeled annual deposition of particulates, nitrogen, and sulfur species under the proposed Limetree Bay Petroleum Complex plant-wide applicability limits EPA Clean Air Act permit.

Affected ESA-listed Species

Potentially affected species include blue, fin, sei, and sperm whales; the North and South Atlantic DPSs of the green turtle, Northwest Atlantic Ocean DPS of the loggerhead turtle, hawksbill turtle, and leatherback turtle; giant manta ray; Nassau grouper; oceanic whitetip shark; Central and Southwest Atlantic DPS of the scalloped hammerhead shark; and boulder star, elkhorn, lobed star, mountainous star, pillar, rough cactus, and staghorn corals (Table 1).

Table 1. ESA-protected species occurring in the action area for the proposed Limetree Bay Air Permit

Species	ESA Status	Critical Habitat	Recovery Plan
Marine Mammals – Cetaceans			
Blue Whale (*Balaenoptera musculus)*	E – 35 FR 18319	-- --	07/1998 10/2018 - Draft
Fin Whale (*Balaenoptera physalus)*	E – 35 FR 18319	-- --	75 FR 47538 07/2010
Sei Whale (*Balaenoptera borealis*)	E – 35 FR 18319	-- --	12/2011
Sperm Whale (*Physeter macrocephalus*)	E – 35 FR 18319	-- --	75 FR 81584 12/2010
Marine Reptiles			
Green Turtle (*Chelonia mydas*) – North Atlantic DPS	T – 81 FR 20057	Designated, but does not occur in St. Croix	FR Not Available 10/1991 – U.S. Atlantic
Green Turtle (*Chelonia mydas*) – South Atlantic DPS	T – 81 FR 20057	-- --	FR Not Available 10/1991 – U.S. Atlantic
Hawksbill Turtle (*Eretmochelys imbricata)*	E – 35 FR 8491	Designated, but does not occur in St. Croix	57 FR 38818 08/1992 – U.S. Caribbean, Atlantic, and Gulf of Mexico
Leatherback Turtle (*Dermochelys coriacea*)	E – 35 FR 8491	Designated, includes Sandy Point in St. Croix 44 FR 17710	10/1991 – U.S. Caribbean, Atlantic, and Gulf of Mexico
Loggerhead Turtle (*Caretta caretta*) – Northwest Atlantic Ocean DPS	T – 76 FR 58868	Designated, but does not occur in St. Croix	74 FR 2995 10/1991 – U.S. Caribbean, Atlantic, and Gulf of Mexico
Fishes			
Giant Manta Ray (*Manta birostris*)	T – 83 FR 2916	-- --	-- --
Nassau Grouper (*Epinephelus striatus*)	T – 81 FR 42268	-- --	8/2018- Outline
Oceanic Whitetip Shark (*Carcharhinus longimanus*)	T – 83 FR 4153	-- --	9/2018- Outline
Scalloped Hammerhead Shark (*Sphyrna lewini*) – Central and Southwest Atlantic DPS	T – 79 FR 38213	-- --	-- --
Marine Invertebrates			
Boulder Star Coral (*Orbicella franksi*)	T – 79 FR 53851	-- --	3/2015- Outline
Elkhorn Coral (*Acropora palmata*)	T – 79 FR 53851	73 FR 72210	80 FR 12146
Lobed Star Coral (*Orbicella annularis*)	T – 79 FR 53851	-- --	3/2015- Outline
Mountainous Star Coral (*Orbicella faveolata*)	T – 79 FR 53851	-- --	3/2015- Outline
Pillar Coral (*Dendrogyra cylindrus*)	T – 79 FR 53851	-- --	3/2015- Outline
Rough Cactus Coral *(Mycetophyllia ferox)*	T – 79 FR 53851	-- --	3/2015- Outline
Staghorn Coral (*Acropora cervicornis*)	T – 79 FR 53851	73 FR 72210	80 FR 12146

Consultation History

On April 29, 2020, EPA contacted the NMFS Southeast Regional Office because they received a comment during the public comment period for the proposed permit. The commenter stated that an ESA section 7 consultation for effects of the emissions on ESA-listed marine species under NMFS jurisdiction should have been completed. An informal ESA section 7 consultation was completed with the United States Fish and Wildlife Service (USFWS) for the proposed permit on February 28, 2020. The USFWS has jurisdiction over sea turtles on land and concurred with EPA's effects determination for hawksbill and leatherback turtles because the modeled impacts and windrose data do not indicate the plume would overlay nesting areas. The USFWS did not include green sea turtles in their concurrence letter even though nesting by this species is reported as increasing on Sandy Point, but the effects determination for green sea turtles would likely be the same as that for the other two sea turtle species.

NMFS Southeast Regional Office referred EPA's inquiry to the Office of Protected Resources on May 13, 2020. The information from EPA included figures showing the output of graphical models of impacts from one-hour emissions for particulates, Nitrogen oxides and Sulfur oxides to illustrate the extent of the plume expected under the permit. On May 20, 2020, NMFS held a conference call with EPA to discuss ESA section 7 consultation requirements. NMFS sent a follow up email after the call with a summary of the potentially affected species, descriptions of whether and how they are likely to be exposed to the permitted emissions, and the elements that EPA would need to include in a request for concurrence. The EPA arranged follow up calls to update NMFS on their progress in developing their consultation request that were held on July 6, July 14, July 27, and August 4, 2020. EPA's request for concurrence on their effects determinations was transmitted to NMFS via e-mail dated August 11, 2020.

Effects of the Action

"Effects of the action" was revised in August 2019 to mean all consequences to ESA-listed species or designated critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 C.F.R. §402.02; see also 50 C.F.R. §402.17).

The applicable standard to find that a proposed action is not likely to adversely affect ESA-listed species or designated critical habitat is that all of the effects of the action are expected to be extremely unlikely to occur, insignificant, or completely beneficial. Beneficial effects have an immediate positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size or severity of the impact and include those effects that are undetectable, not measurable, or so minor that they cannot be meaningfully evaluated. Insignificant is the appropriate effect conclusion when plausible effects are going to happen, but will not rise to the level of constituting an adverse effect.

Cetaceans. Fin and sei whales are typically found in deep, offshore waters, primarily in temperate to polar latitudes, and less commonly in the tropics. Blue whales will forage in shallower waters, but typically occur in more northern latitudes and are infrequent in the Caribbean. Sperm whales are the most common ESA-listed cetacean in Caribbean waters, but typically inhabit water depths of 1,968 feet (600 meters) or more and are uncommon at depths less than 984 feet (300 meters). As shown in Figure 4, suitable depths where sperm whales are expected to occur are five or more kilometers from Limetree Bay Marine Terminal. Fin, sei, blue, and sperm whales are extremely unlikely to be exposed to the permitted emissions; therefore, the proposed permit may affect, but is not likely to adversely affect these ESA-listed whale species.

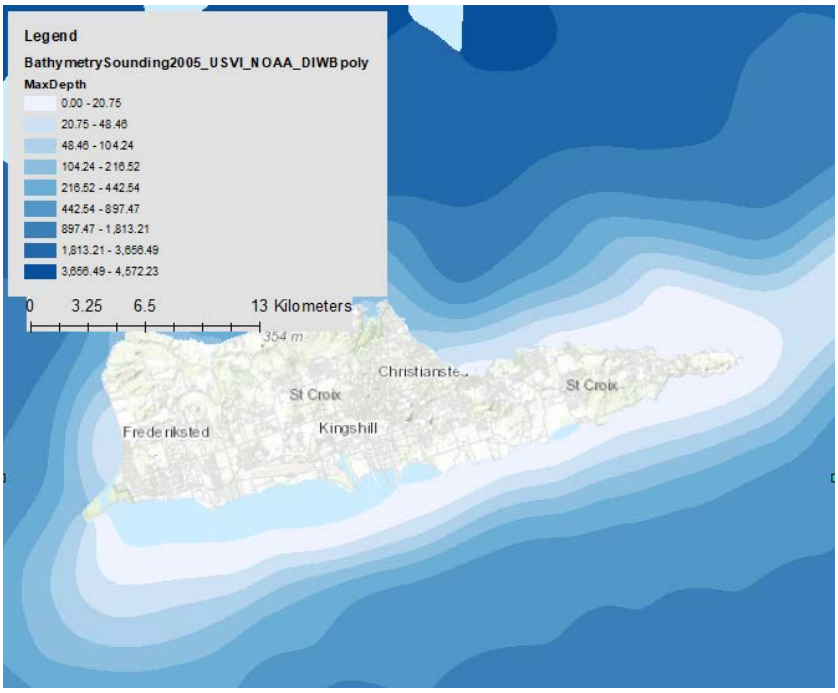

Figure 4. Bathymetry soundings for St. Croix

Elasmobranchs. Oceanic whitetip sharks occur in the Caribbean, but in open ocean offshore waters. This species is not expected to be in the area where deposition from the plume generated by plant emissions may occur, which is shallow water on the shelf. Giant manta rays are also primarily a deepwater species, but will frequent nearshore cleaning stations. No cleaning stations are reported in the U.S. Caribbean based on information in the status review prepared as part of species' listing (Miller and Klimovich 2016), but giant manta rays have been observed off Limetree Bay, as well as other sites around St. Croix during scientific surveys (A. Dempsey, BioImpact, pers. comm. to L. Carrubba, NMFS, January 26, 2018 and February 26, 2018). Adult scalloped hammerhead sharks are oceanic/pelagic and juveniles occur in inshore shallow coastal waters. Known nursery areas in the U.S. Virgin Islands for this species are in St. Thomas and St. John with none reported in St. Croix. The St. Croix checklist of marine and inland fishes includes the scalloped hammerhead shark due to records of two individuals caught as bycatch in the late 1980s (Smith-Vaniz and Jelks 2014; Tobias 1991).

Based on this information, giant manta rays and scalloped hammerhead sharks may transit past the Limetree Bay facilities so any exposures to deposition from plumes generated by emissions from the plant under the air permit would be short-term. Oceanic whitetip sharks are extremely unlikely to be exposed to the permitted emissions. Giant manta rays and scalloped hammerhead sharks may be exposed to emitted toxicants but at durations or intensities at which toxic responses are expected to be extremely unlikely to occur. Therefore, the proposed permit may affect, but is not likely to adversely affect oceanic whitetip sharks, giant manta rays, and the Central and Southwest Atlantic DPS of scalloped hammerhead sharks.

Nassau Grouper. Juvenile Nassau grouper use nearshore habitats such as seagrass beds as nursery areas, while adults are present in deeper waters with coral habitat further from shore. The St. Croix population of this species has seen a dramatic decline due to overfishing (Garcia-Moliner and Sadovy 2007; Pittman et al. 2014). This species was not recorded in surveys of marine protected areas around the U.S. Virgin Islands conducted between 2002 and 2011. The abundance of the species in waters off of St. Thomas is so low, reproductive adults participate in spawning aggregations with yellowfin grouper rather than forming their own single-species aggregations. Because of the dramatic declines in the population of this species, Nassau grouper are not expected to be present in waters of the action area. We have already established that the emissions under the proposed permit are unlikely to cause localized acidification. Thus, exposure of Nassau grouper to impaired water quality resulting from the permitted emissions is considered extremely unlikely to occur because they are not expected to be present in the action area and water quality is extremely unlikely to be affected by the permitted emissions, should an itinerant individual transit the area. Therefore, the proposed permit may affect, but is not likely to adversely affect Nassau grouper.

Sea Turtles. Green, hawksbill, leatherback, and loggerhead turtles are air-breathing species. Leatherback sea turtles are only present in the action area during nesting season, which peaks around July in the U.S. Caribbean. The rest of the time, this species is found in deep, offshore waters. Loggerhead sea turtles are rare in the U.S. Caribbean, although nesting by this species was reported on Buck Island in the 2000's. Green and hawksbill sea turtles are present year-round in the action area where they nest and use nearshore areas such as seagrass beds and coral habitats for refuge and foraging. The emissions evaluated during this informal consultation are respiratory irritants. Sea turtle prey are not expected to accumulate these pollutants and become toxic to predators and seagrasses would not respond to respiratory irritants. As established above, localized ocean acidification is not likely to occur as a result of the emissions, so there will be no effects on sea turtle prey or seagrasses. Thus, ESA-listed sea turtle species may be exposed to permitted emissions through inhalation when in the area affected by the Limetree Bay emission plume. For this reason, an effects assessment for sea turtle inhalation exposures is needed.

In its request for concurrence, The EPA based its effects determination for sea turtles on modeling indicating the surface deposition impacts would be below acid deposition critical loads[2]. Inhalation exposures are a function of concentration in a volume of air, so NMFS'

[2] A critical load is defined by EPA in their request for concurrence as ''a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge."

assessment of effects on sea turtles used the estimates provided by EPA for one-hour and 24-hour modeled impacts to surface level air concentrations (**Error! Reference source not found.**).

NMFS agrees that loggerhead and leatherback sea turtles are extremely unlikely to be exposed to emitted toxicants because of the rarity of loggerheads in the action area and the presence of leatherback sea turtles only during nesting season and only in transit to and from the nesting beach on Sandy Point. However, green and hawksbill sea turtles are present in nearshore waters around St. Croix year-round and include resident juveniles.

EPA model results indicate over-ocean surface level and PM2.5, nitrogen dioxide, and sulfur dioxide, resulting from permitted emissions to be above ambient background. This effects assessment for inhalation exposures of sea turtles applies thresholds based on the protection of human health because these are best available information for such exposures at this time.

Inhaled particulates are not expected to have increased levels of incorporated metals and organics because residual fuel will not be combusted at Limetree, as stated previously. Regardless of source and content, particulates are hazardous. The EPA's primary 24-hour human health-based standard for PM2.5 is 15 micrograms per cubic meter. EPA's request for concurrence reports the worst case, 24-hour maximum-modeled surface levels for PM2.5 range from 20 to 26 micrograms per cubic meter. While the worst case scenario PM2.5 is expected to be higher than the 24-hour standard, turtles do not breathe air continuously over a 24 hour period as humans do. They fill their lungs and can spend hours underwater. There is a low probability that sea turtles would take in air at the same time a 24-hour maximum surface level PM2.5 concentration event occurs. Exposures to permitted PM2.5 emissions at harmful levels are extremely unlikely to occur.

Inhaled nitrogen dioxide is an irritant, creating nitrogen free radicals that damage lung tissue. The current Occupational Safety and Health Act Permissible Exposure Limit (OSHA PEL)[3] for nitrogen dioxide is 9 milligrams per cubic meter (Centers for Disease Control, 08/18/2020). EPA's request for concurrence reports the plausible worst case, one-hour maximum-modeled surface levels of nitrogen dioxide over water to range from 70 to 150 micrograms per cubic meter. This is about 60 to 128-fold lower than the OSHA PEL. Exposures to permitted emissions of nitrogen dioxide are expected to be insignificant because harmful levels are not expected to occur in the air overlying the sea.

Inhaled sulfur dioxide is an irritant, reacting with mucous membranes to form sulfurous acid. The current OSHA PEL is 13 milligrams per cubic meter (Centers for Disease Control, 08/18/2020). EPA's request for concurrence reports the plausible worst case, one-hour maximum-modeled surface levels of sulfur dioxide over water to range from 50 to 70 micrograms per cubic meter. This is about 185 to 260-fold lower than the OSHA PEL. Exposures to permitted emissions of sulfur dioxide are expected to be insignificant because harmful levels are not expected to occur in the air overlying the sea.

In summary, NMFS believes that inhalation exposures of loggerhead and leatherback turtles to harmful levels of PM2.5, nitrogen dioxide, and sulfur dioxide are extremely unlikely to occur. NMFS also believes that the effects of inhalation exposures of hawksbill and green sea turtles

[3] Permissible Exposure Limit (PEL): The maximum upper exposure legal limit to a hazardous substance exposure that an employee can be exposed to in an 8-hour period.

will be insignificant because harmful levels of these pollutants not expected to occur. Therefore, the proposed permit may affect, but is not likely to adversely affect the North and South Atlantic DPSs of green sea turtles, hawksbill sea turtles, leatherback sea turtles, and the Northwest Atlantic DPS of loggerhead sea turtles.

Coral Species. Boulder star coral, elkhorn coral, lobed star coral, mountainous star coral, pillar coral, rough cactus coral, and staghorn coral are non-mobile species that are expected to occur in the coral habitats within the action area of Limetree's emissions. NMFS' primary concern for coral is the potential for the emissions to cause localized ocean acidification affecting coral skeletal formation and vulnerability to disease. Rising levels of atmospheric carbon monoxide lead to more absorption into seawater, increasing its acidity. In turn, increasing acidity impairs the availability of carbonate ions used by organisms with calcium carbonate shells and skeletons, including hard corals. We previously established that localized acidification is not likely to occur, given the acid neutralizing capacity of seawater and the relative low extent of acidifying deposition. Thus, exposure of ESA-listed coral to impaired water quality resulting from the permitted emissions is considered extremely unlikely to occur. The proposed permit may affect, but is not likely to adversely affect ESA-listed coral species.

Conclusion

Based on this analysis, NMFS concurs with EPA's determination that the effects of the proposed action may affect but are not likely to adversely affect the subject ESA-listed species.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by the federal agency**,** or by NMFS, where discretionary federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect an ESA-listed species or designated critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the ESA-listed species or designated critical habitat that was not considered in this consultation; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 C.F.R. §402.16).

Please direct questions regarding this letter to Dr. Pat Shaw-Allen, Consulting Biologist, at (301) 427-8473, or by email at pat.shaw-allen@noaa.gov, or me at (301) 427-8495, or by email at cathy.tortorici@noaa.gov.

Sincerely,

TORTORICI.CATHRYN.E.1365826850 Digitally signed by TORTORICI.CATHRYN.E.1365826850 Date: 2020.09.04 09:27:39 -04'00'

Cathryn E. Tortorici
Chief, ESA Interagency Cooperation Division
Office of Protected Resources

cc: Annamaria Colecchia, Neha Sareen, Joseph Siegel, EPA

Literature Cited:

Dodds, W. K. 2002. Freshwater Ecology. Academic Press, San Diego, CA.

Garcia-Moliner, G., and Y. J. Sadovy. 2007. The Case for Regional Management of the Nassau grouper, Epinephelus striatus. Proceedings of the 60th Gulf and Caribbean Fisheries Institute Punta Cana, Dominican Republic

Miller, M. H., and C. Klimovich. 2016. Endangered Species Act Status Review Report: Giant Manta Ray (*Manta birostris*) and Reef Manta Ray (*Manta alfredi*). Draft Report to National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD. December 2016. 127 pp.

Pittman, S. J., and coauthors. 2014. Marine protected Areas of the U.S. Virgin Islands: Ecological Performance Report.

Smith-Vaniz, W. F., and H. L. Jelks. 2014. Marine and inland fishes of St. Croix, U. S. Virgin Islands: an annotated checklist. Zootaxa 3803(1):1-120.

Stumm, W., and J. J. Morgan. 1996. Aquatic Chemistry: Chemical Equilibria and Rates in Natural Waters, 3rd edition. Wiley-Interscience Publishers, New York.

Tobias, W. 1991. Billfish bycatch observer data of the U.S. swordfish longline fleet, St. Croix. U.S. Virgin Islands-1988 and 1989. Col. Vol. Sci Pap. ICCAT 35(21:518-523.